

REVISED 11/09

LSUE COURSE SYLLABUS

I.	PHYS 2102	Instructor: Michael Scanlan
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II.	Course description from the current LSUE catalog:
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General Physics for Technical Students. Lec. 3; Cr. 3.
Principles and applications of electricity, magnetism, light, and modern physics for students majoring in mathematics, chemistry, or engineering.
Prerequisite: Physics 1201 and Mathematics 1552.

III.	Textbook(s) and other required materials:
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Physics for Scientists and Engineers, 7th ed. Serway and Jewett, Thompson.

IV.	Evaluation/grading (policy and basis; number and frequency of tests and papers; weights of particular tests or papers; etc.):
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During a semester, three one hour exams (each worth 100 points) and a 2 hour final exam (worth 200 points) will be given. Homework will be completed online via WebAssign. Usual 10 point scale is applied.

Homework will not be accepted late. Make-up exams will not be scheduled. If an exam is anticipated to be missed with an excused absence, the student may take the exam BEFORE it is given to the class, otherwise, the final exam grade will be substituted for the missed exam.

V.	Policies pertaining to attendance, late work, make-up work, etc.:
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Attendance for each class period is required in order for the students to understand the materials assigned to them. For an anticipated absence on a regular test time, due to an unavoidable difficulty, consult with your instructor.

VI.	Course objectives:
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- A. Develop an understanding of the inner workings of the physical systems.
- B. Study physics laws and observe how they are connected to the physical systems mentioned in A.
- C. Use "logical deduction" in identifying cause and effects.
- D. Use mathematics as a physical modeling technique. Problem solving is emphasized.
- E. Relate A, B, C, D to the real life problems. (applications)

VII.	Major instructional objectives:
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Because Physics 2102 is the backbone of all engineering and physical science disciplines, an intentional attention will be given to the techniques of problem solving pertinent to the different subject matters in engineering and sciences. The aim is to expedite a smooth transition to the forthcoming technical courses.

VIII.	Brief summary of course content by major units of instruction:
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- A. Electrostatics
 - 1. Electric Charge
 - 2. Coulomb's Law
 - 3. The Electric Field
 - 4. Conductors and Insulators
 - 5. Motion of Charges in an Electric Field
 - 6. Electric Flux
 - 7. Gauss' Law
 - 8. Calculating Electric Fields
 - 9. Potential Difference
 - 10. Work and Energy in Electrostatics
 - 11. Absolute Potentials
 - 12. The Electron Volt
 - 13. Potential of Uniformly Charged Bodies
- B. Circuit Elements
 - 1. EMF Sources
 - 2. Electric Current
 - 3. Resistance
 - 4. Capacitors
 - 5. Electric Work and Power
 - 6. Kirchhoff's Rule
 - 7. RC Time Constant
 - 8. Series and Parallel Circuits
 - 9. The Potentiometer
 - 10. Electrical Safety
- C. Magnetism
 - 1. Magnetic Fields
 - 2. Force on Currents and Moving Charges
 - 3. Definition of Magnetic Induction
 - 4. Meter Movements and Motors
 - 5. Ampere's Circuital Law
 - 6. Sources of Magnetic Fields
 - 7. Induced EMF's
 - 8. Mutual and Self-Inductance
 - 9. The LR Circuit
 - 10. Energy in a Magnetic Field
 - 11. Rotating Coils; Generators

12. Dielectric and Magnetic Materials

D. Alternating Current

1. RMS Quantities
2. Single-Element Circuits
3. The Series LRC Circuits
4. Vector Representations
5. Resonance
6. Power Transmission and the Transformer
7. Decay of Oscillations

E. Waves

1. Interrelations of Electromagnetic Laws
2. Electromagnetic Waves
3. Spherical and Plane Waves
4. Reflection of Waves
5. Refraction of Waves
6. Ray Diagrams
7. Interference of Waves
8. Young's Double-Slit Experiment
9. Speed of Light in Gases
10. Diffraction of Waves
11. Optical Instruments
12. Resonance of Waves

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F. Modern Physics

1. Planck's Hypothesis
2. The Photoelectric Effect
3. Compton Scattering
4. Bohr's Theory of the Hydrogen Atom
5. DeBroglie Waves
6. Schrodinger's Equation
7. The Uncertainty Principle
8. Spectra of Atoms
9. The Laser
10. Nuclei of Atoms
11. Nuclear Binding Energy
12. Radioactivity
13. Nuclear Fission
14. High Energy Physics

IX.	Methods of instruction:
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Scheduled lectures accompanied with the use of demonstrations will constitute the core of the instructional method.

ADS	Americans with Disabilities Act) Statement
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Any student who is a “qualified individual with a disability” as defined by Section 504 of the Rehabilitation Act and Title II of the ADA, and who will need accommodated services (e.g., note takers, extended test time, audiotape, tutorials, etc.) for this course must register and request services through the Office of Academic Assistance Programs, S-150.

CSD	CODE OF STUDENT CONDUCT
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LSUE enforces discipline on campus to protect the academic environment of the campus and the health and safety of all members of the University community. To accomplish this objective, the University enforces standards of conduct for its students. Students who violate these standards can be denied membership in the LSUE community through imposition of disciplinary sanctions.

The LSUE Code of Student Conduct can be found on the LSUE website (lsue.edu). Follow the “Current Students” link from the homepage, and then click on “Student Handbook.”